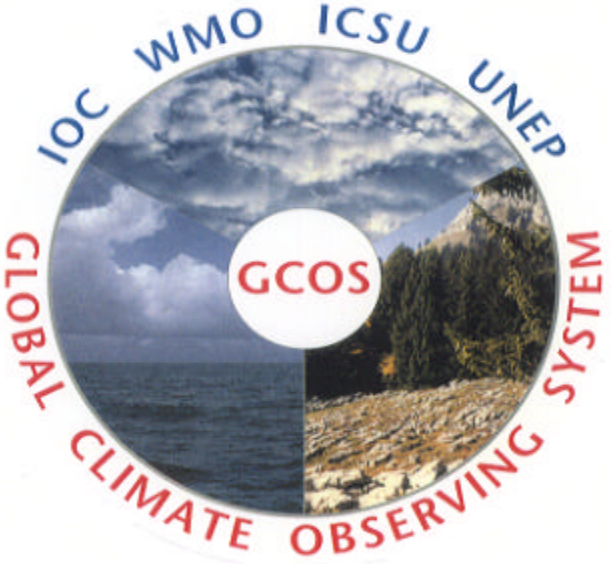
WMO IOC UNEP ICSU

Progress following the Second Adequacy Report



GCOS Presentation to CEOS/IGOS-P

Second Report on the Adequacy of the Global Observing Systems for Climate

- **Goals of the Second Adequacy Report were to:**
  - **Determine progress since the first Adequacy Report (COP-4);**
  - **Determine the degree to which current networks / systems meet scientific requirements and observing principles;**
  - **Assess how well current and planned systems meet the needs of the Convention.**
- **Basis for Action**
  - **Based on national reports to UNFCCC / COP and other information**
  - **Involve international experts (including IPCC experts) in analysing the adequacy of the current global observing systems for climate;**
  - **Integrated approach to global climate observing systems, including the exploitation of new and emerging methods.**
- **Final Report available - http://www.wmo.ch/web/gcos**

Main Conclusions from Report

- **Need for full implementation of integrated global observing systems for climate, sustained on the basis of a mix of high-quality satellite and *in situ* measurements, dedicated infrastructure and targeted capacity-building which will require commitment of all Nations.**
  - **Achieving global coverage and climate-quality observations for the essential climate variables (see Table 1) is essential to meet the needs of the UNFCCC and IPCC.**
  - **Adherence to the principles of free and unrestricted exchange of data, particularly for the Essential Climate Variables (See Table 1).**
  - **Adherence to the GCOS Climate Monitoring Principles for global climate observations from both *in situ* networks and satellites.**
  - **Ensure that observations and associated metadata, including historical observations, are available at international data centres.**

Table 1: Essential Climate Variables

- **Atmospheric**
  - **Surface –** Air temperature, Precipitation, Air pressure, Surface radiation budget, Wind speed and direction, Water vapour
  - **Upper Air –** Earth radiation budget (including solar irradiance), Upper-air temperature (including MSU radiances), Wind speed and direction, Water vapour, Cloud properties
  - **Composition –** Carbon dioxide, Methane, Ozone, Other long-lived greenhouse gases, Aerosol properties.
- **Oceanic**
  - **Surface –** Sea-surface temperature, Sea-surface salinity, Sea level, Sea state, Sea ice, Current, Ocean colour (for biological activity), Carbon dioxide partial pressure
  - **Sub-surface:**Temperature, Salinity, Current, Nutrients, Carbon, Ocean tracers, Phytoplankton
- **Terrestrial**
  - River discharge, Water use, Ground water, Lake levels, Snow cover, Glaciers and ice caps, Permafrost and seasonally-frozen ground, Albedo, Land cover (including vegetation type), Fraction of absorbed photosynthetically active radiation (FAPAR), Leaf area index (LAI), Biomass, Fire disturbance.

Main Conclusions from Report

- **Need for a mechanism to prepare guidance materials and develop agreements on standards and regulations for terrestrial observing systems, data, and products.**
- **Impact assessment and adaptation strategies will require climate-observing networks with a denser distribution of stations and often more frequent observations, e.g., regional and national networks**
- **Full implementation will require commitment of all Nations to targeted capacity-building and support for system improvements.**
  - **Voluntary Donor Fund to support high-priority needs in developing countries, especially the least developed countries and small island developing states, and some countries with economies in transition.**

Integrated Global Climate Products

- **Internationally-coordinated re-analysis - monitoring climate trends, ocean re-analysis, and atmospheric composition and other aspects of climate forcing.**
- **Integrated global climate products (Table 2) Variables:**
  - **Largely dependent upon satellite observations).**
  - **Benefiting from the reanalysis of homogeneous historical data**
  - **Adherence to the GCOS Climate Monitoring Principles for *in situ* and satellite systems**
  - **Accessible to all Parties.**
- **Developing a strategy for implementing these global products could be an important role for the Integrated Global Observing Strategy (IGOS) Partners.**

Table 2: Variables largely dependent upon satellite observations

- **Atmospheric**
  - Precipitation, Earth radiation budget (including solar irradiance), Upper-air temperature (including MSU radiances), Wind speed and direction (especially over the oceans), Water vapour, Cloud properties, Carbon dioxide, Ozone, Aerosol properties.
- **Oceanic**
  - Sea-surface temperature, Sea level, Sea ice, Ocean colour (for biological activity).
- **Terrestrial**
  - Snow cover, Glaciers and ice caps, Albedo, Land cover (including vegetation type), Fraction of absorbed photosynthetically active radiation (FAPAR), Fire disturbance.

Some Issues for discussion by IGOS–P – from these conclusions

Integrated Global Climate Products

- **Request each theme to review coverage and climate suitability of available products within essential variables list and suggest possible strategies.**
  - **Noting the responses to the report of the IGOS Implementation Task Force**
- **Consider need for a workshop to build upon and consolidate initial inputs from themes to detail requirements and principles that such products should endeavor to achieve.**
- **Consider agency meeting on possible coordinated approaches, e.g., SAF's**

SBSTA response to second adequacy report

The SBSTA noted that the GCOS steering committee report to the SBSTA at its eighteenth session identified four overarching and equally high-priority recommendations relating to **observing standards and data exchange, integrated global climate-quality products, capacity-building and systems improvements, and the issue of reporting by Parties,** and agreed to consider these recommendations in its further work.

The SBSTA requested Parties to submit, by 15 September 2003, **views on the priorities for actions** arising from the second adequacy report, ….. **as a further step towards the development by the GCOS secretariat of an implementation plan for integrated global observations for climate ……for consideration by the SBSTA at its nineteenth session**

4. *Requests ……* taking into account international and intergovernmental mechanisms, to coordinate the development of a phased five- to ten-year implementation plan…… using a mix of high-quality **satellite and in situ measurements, dedicated infrastructure and targeted capacity-building,**

   such a plan being developed

- To draw on the second **adequacy report and the views** of Parties;
- To take into consideration **existing** global, regional and national plans, programmes and initiatives;
- To be based on extensive **consultations** with a broad range of scientists and data users;
- To include **indicator**s for measuring its implementation
- To identify **resource requirements** and funding options.

GCOS Implementation plan to COP in the context of GEO

Points for discussion

- Coordination with GEO
- Level of detail
- Interpretation of 10 year time frame
- Priorities
- Costing

Timetable

- Jim Rasmussen acting as editor
- Rough Outline in progress for first drafting meeting January – Geneva
- Draft with GEO and on web for open review February
- etc etc
- Available for SBSTA 21 Nov/Dec 2004

Expected Implementation Report Priorities

- Institutionalisation of and support of Integrated products
- Key Network Establishment / Ensuring Global coverage and Participation
- Improved custody of existing networks, standards and data
- Developmental actions

Key Network Establishment

- Basic climate and its variation
- Forcings
- Feedbacks
- Impacts
- Prediction

Institutionalisation of and support of Integrated products

- Seeking to establish product centres, inc reanalysis
- Products listed and existing product centres noted
- Strategy for sustained remote sensing
- Linked needs for in-situ measurements mentioned

Ensuring Global coverage and Participation

- An agenda for donor support
- Focus on networks linked to the highest priorities and impacts
- Ensuring Critical “Sparse” global coverage
- GUAN-upper air sonde, Sea level, Glaciers, Permafrost, key atmospheric chemistry needs

Improved custody of existing networks, standards and data

- Real time monitoring
- Data centres and reporting on exchange
- GCOS Climate monitoring principles
- Terrestrial Standards body
- GSN surface climate, River flow, Land Use

Developmental actions

- New space based opportunities
- New in-situ instrumentation
- New products

Summary

- The 2nd Adequacy report sets a clear agenda but needs some attention in coverage of research/development activities

- Presentation structure is a challenge and a matter of current discussion

- Costing of some elements including space based items is very difficult due to shared use and wide range of magnitudes

- Linking with GEO should be aided by draft material